

FIG. 1

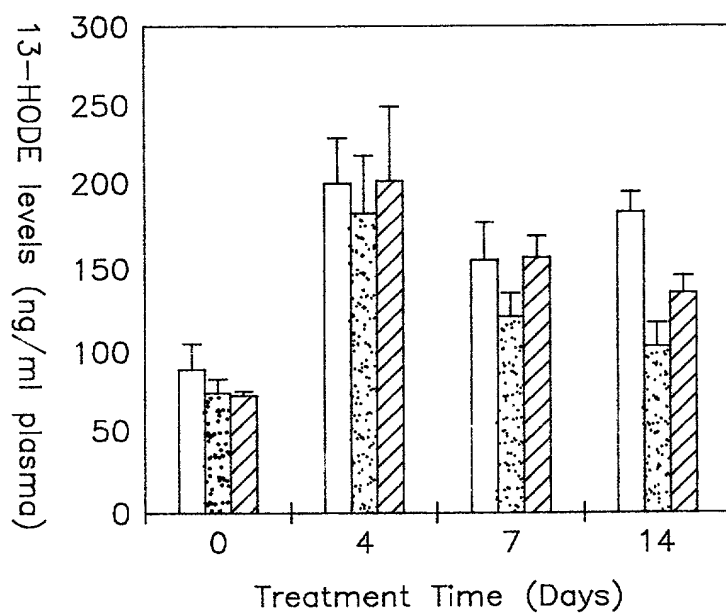


FIG. 1A

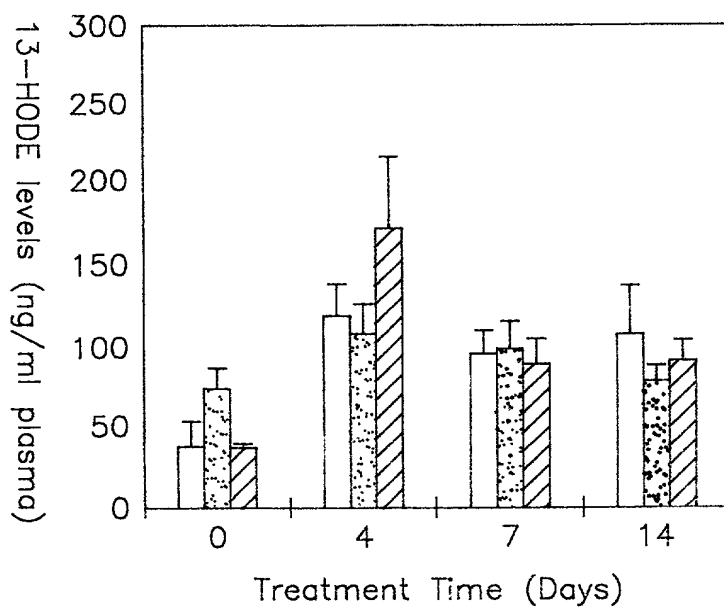


FIG. 2

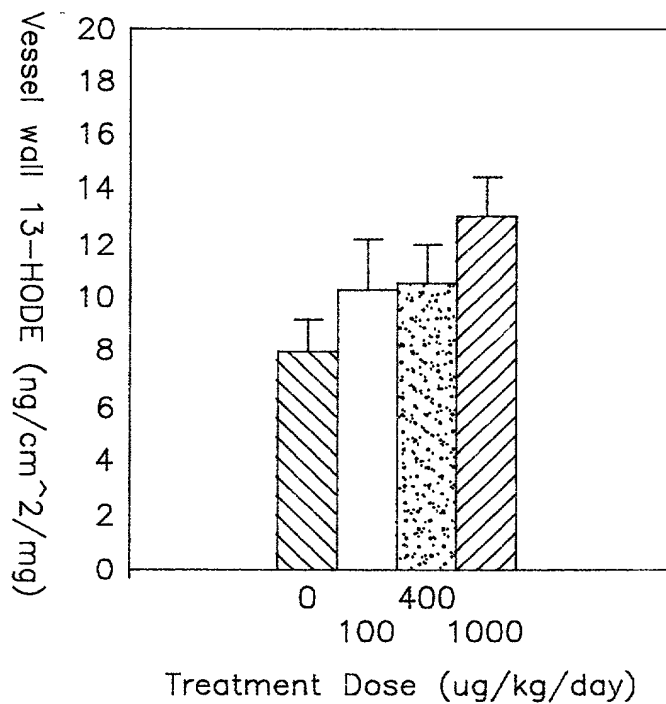


FIG. 2A

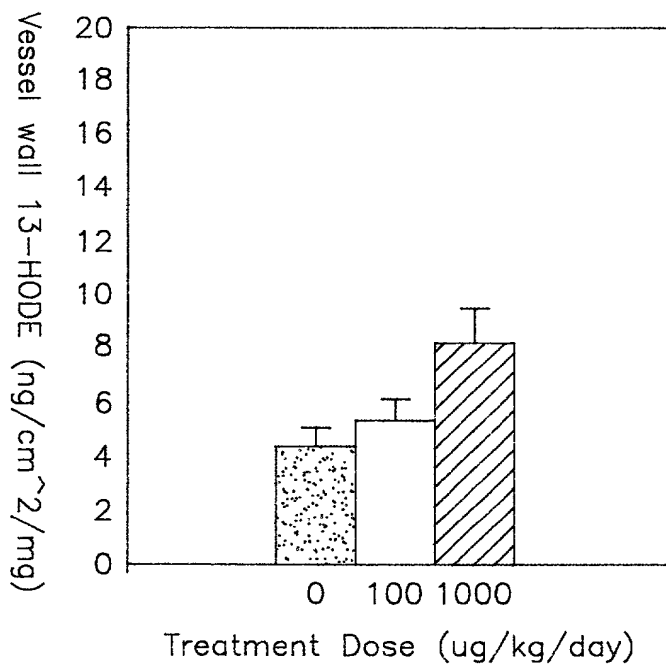
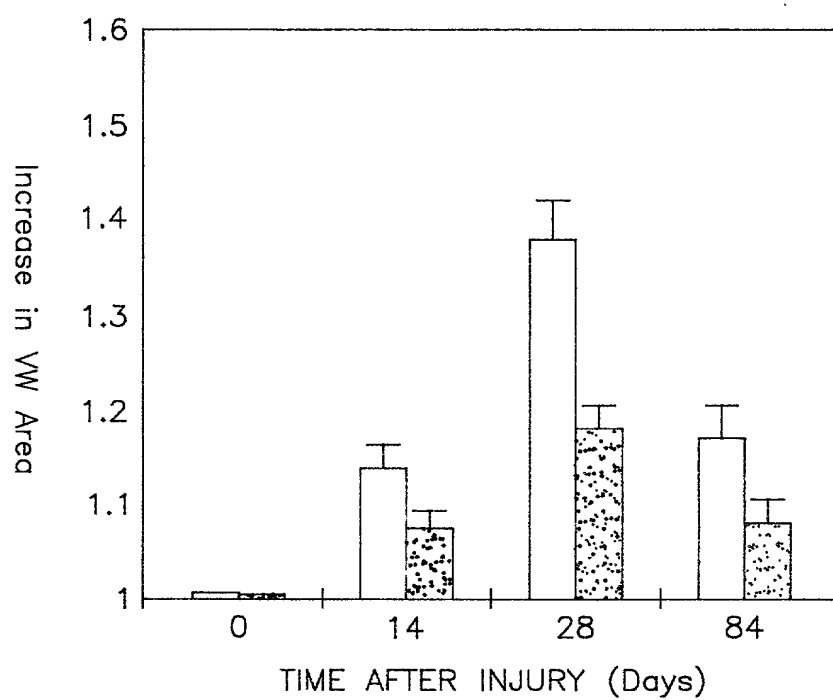


FIG. 3



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FIG. 4

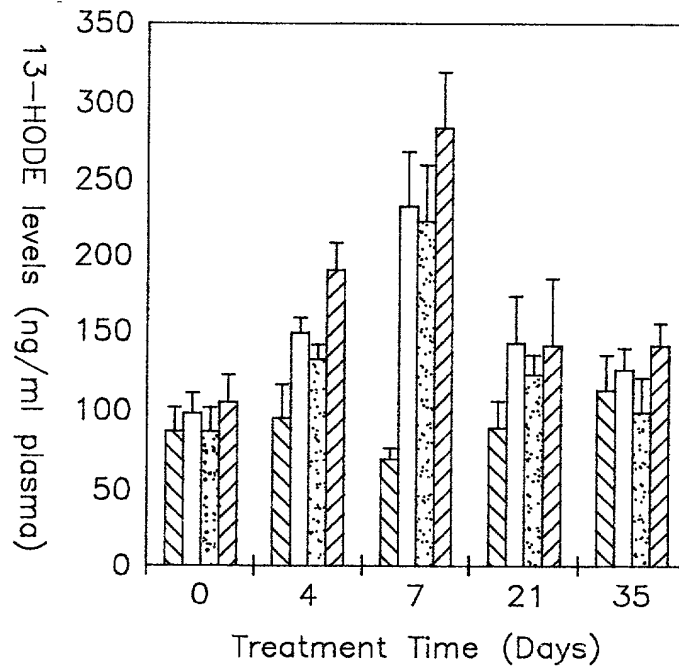


FIG. 4A

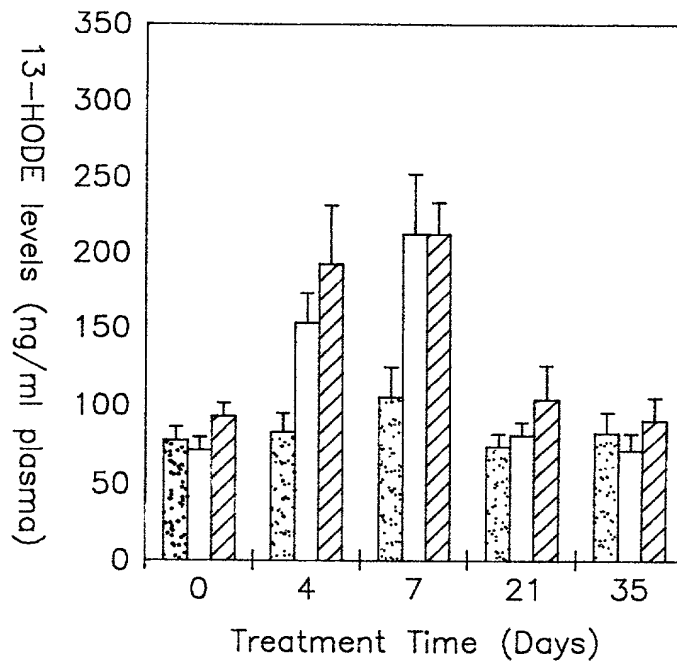


FIG. 5

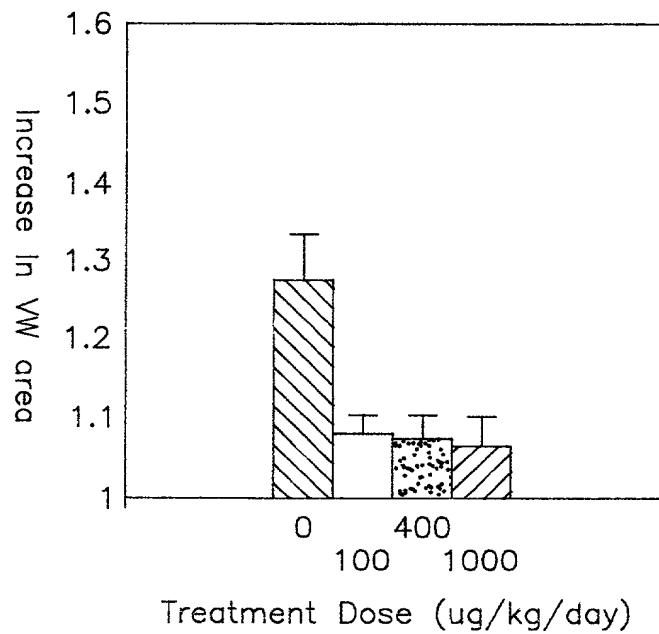


FIG. 5A

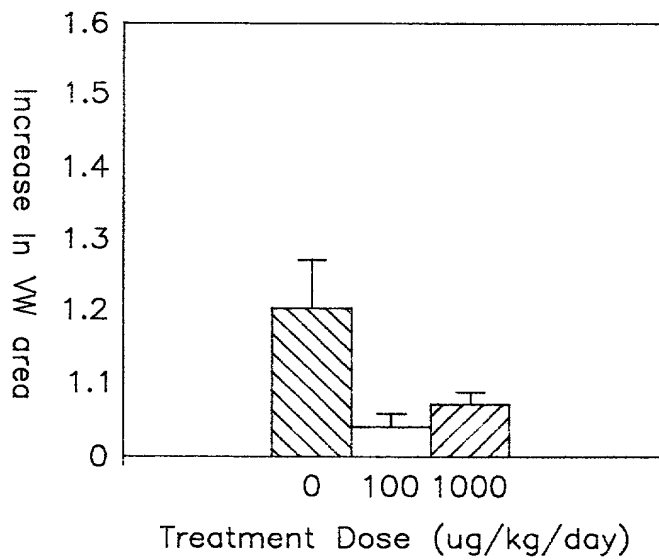
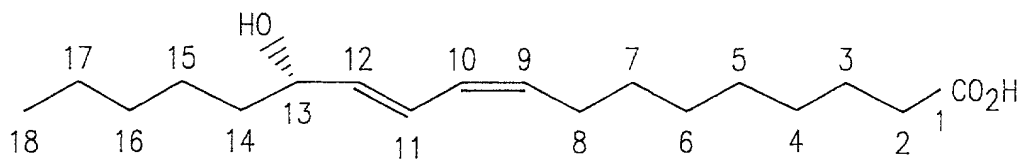


FIG. 6



Proton nmr spectrum (270MHz;  $\text{CDCl}_3$ )

$\delta(\text{ppm})$  6.5(1H, dd,  $H_{11}$ ,  $J_{11,10} = 11\text{Hz}$ ,  $J_{11,12} = 15.2\text{Hz}$ ), 6.0(1H, t,  $H_{10}$ ,  $J_{10,9} = J_{10,11} = 11\text{Hz}$ ), 5.7(1H, dd,  $H_{12}$ ,  $J_{12,11} = 15.2\text{Hz}$ ,  $J_{12,13} = 6.8\text{Hz}$ ), 5.4(1H, dt,  $H_9$ ,  $J_{9,8} = 7.7\text{Hz}$ ,  $J_{9,10} = 10.8\text{Hz}$ ), 4.1(1H, m,  $H_{13}$ ), 2.4(2H, t,  $H_2$ ,  $J_{2,3} = 7.3\text{Hz}$ ), 2.2(2H, m,  $H_8$ ), 1.6(4H, m,  $H_3$ ,  $H_{14}$ ), 1.3(14H, m,  $H_{17}$ ,  $H_{16}$ ,  $H_{15}$ ,  $H_7$ ,  $H_6$ ,  $H_5$ ,  $H_4$ ) and 0.9 (3H, t,  $H_{18}$ ,  $J_{18,17} = 6.7\text{Hz}$ ).

Carbon-13 nmr spectrum (67.8MHz,  $\text{CDCl}_3$ )

$\delta(\text{ppm})$  179.3( $C_1$ ), 135.6( $C_{12}$ ), 132.6( $C_9$ ), 127.8( $C_{10}$ ), 125.8( $C_{11}$ ), 72.9( $C_{13}$ ), 37.1–22.4( $C_{17}$ ,  $C_{16}$ ,  $C_{15}$ ,  $C_{14}$ ,  $C_8$ ,  $C_7$ ,  $C_6$ ,  $C_5$ ,  $C_4$ ,  $C_3$ ,  $C_2$ ) and 13.9( $C_{18}$ ).

Infrared spectrum

3500–2500 $\text{cm}^{-1}$  (broad O–H stretch) and 1709 $\text{cm}^{-1}$  (C=O stretch)

Ultraviolet spectrum (ethanolic solution)

$\lambda_{\text{max}} = 232\text{nm}$  ( $\epsilon \equiv 25,000 \text{ mol}^{-1} \text{ dm}^3 \text{ cm}^{-1}$ )

Soluble in ethanol, dichloromethane

Insoluble in hexane, water.